What is claimed is:

1. A method of providing an antenna pattern, said method comprising the steps of:

selecting at least one of an arbitrary beam width and an arbitrary beam direction for said pattern; and

providing said antenna pattern according to said at least one of said selected arbitrary beam width and arbitrary beam direction.

2. A method of providing an antenna pattern according to claim 1, wherein both said arbitrary beam width and said arbitrary beam direction are selected for said pattern and said antenna pattern is provided according to said arbitrary beam width and arbitrary beam direction.

3. The method of claim 1, wherein at least one of said arbitrary beam direction and said arbitrary beam width for said pattern is determined from incoming radio waves estimated in relation to traffic conditions.

4. The method of claim 1, wherein at least one of said beam direction and said beam width for said pattern is selected from preset values.

5. A method of providing an antenna pattern according to claim 1, further comprising the steps of:

calculating integral limits for estimating excitation coefficients for a linear array antenna based on said selected beam width and beam direction;

calculating said excitation coefficients; and

transforming said excitation coefficients into excitation coefficients of a circular array antenna,

wherein said antenna pattern is provided based upon said excitation coefficients of said circular array antenna.

6. A method of providing an antenna pattern according to claim 5, wherein said excitation coefficients are calculated by a Fourier series.

7. A receiving system for use with a circular array antenna, said receiving system comprising:

a calculator for establishing an antenna pattern of said circular array antenna based upon at least one of an arbitrary beam width and an arbitrary beam direction; and

a pathway for effecting signals obtained by use of said antenna based on said established antenna pattern.

8. The receiving system of claim 7, further comprising:

a receive frequency converter for converting radio frequency signals received by said circular array antenna to either intermediate frequency signals or baseband signals,

wherein either said intermediate frequency signals or said baseband signals are multiplied by coefficients calculated by said calculator, respectively, to form resultant signals, and

wherein said resultant signals are combined.

9. A receiver comprising:

a circular array antenna having a plurality of antenna elements disposed circularly;

a coefficient calculator for calculating excitation coefficients for said circular array antenna based on a beam direction and a beam width of a desired antenna pattern;

a receive frequency converter for converting radio frequency signals received by said circular array antenna to either intermediate frequency signals or baseband signals; and

a plurality of receive beam formers, each of said receive beam formers for multiplying either said intermediate frequency signals or said baseband signals by said coefficients calculated by said coefficient calculator, respectively,

and combining resultant signals,

wherein said receive beam formers are coupled in parallel to said receive frequency converter, and

wherein said coefficient calculator is commonly coupled to said receive beam formers.

10. A receiver comprising:

a circular array antenna having a plurality of antenna elements disposed circularly;

a coefficient calculator for calculating excitation coefficients for said circular array antenna based on a beam direction and a beam width of a desired antenna pattern;

a plurality of receive frequency converters, each of said receive frequency converters for converting radio frequency signals received by said circular array antenna to either intermediate frequency signals or baseband signals; and

a plurality of receive beam formers, each of said receive beam formers for multiplying either said intermediate frequency signals or said baseband signals by said coefficients calculated by said coefficient calculator, respectively, and combining resultant signals,

wherein said receive frequency converters and said receive beam formers are coupled in parallel to said circular array antenna, and

wherein said coefficient calculator is coupled to said receive beam formers.

11. The receiver of claim 9, wherein said coefficient calculator comprises means for setting an antenna power of each of said beams, and said coefficient calculator comprises means for setting the number of beams which is equal to the number of receive beam formers.

12. The receiver of claim 10, wherein said coefficient calculator comprises means for setting an antenna power of each of said beams, and

wherein said coefficient calculator comprises means for setting the number of beams which is equal to the number of receive beam formers.

13. The receiving system of claim 7, further comprising:

an arrival direction estimating unit for estimating arrival directions of incoming radio waves in relation to traffic conditions; and

a statistical processor for statistically processing outputs of said arrival direction estimating unit to determine said beam direction and said beam width.

14. The receiving system of claim 7, further comprising:

a storage unit for previously storing beam directions and beam widths,

wherein at least one of said arbitrary beam direction and said arbitrary beam width is read from said storage unit.

15. A transmitting system for use with a circular array antenna, said transmitting system comprising:

a calculator for establishing an antenna pattern for said circular array antenna based upon at least one of an arbitrary beam width and an arbitrary beam direction ; and

a pathway for effecting signals to be propagated by use of said antenna based on said established antenna pattern.

16. The transmitting system of claim 15, further comprising:

a transmit beam former for splitting a transmitted signal into signals, the number of which is the same as the number of antenna elements of said circular array antenna, and multiplying said signals by coefficients calculated by said calculator, respectively, thereby to form transmit beams; and

a transmit frequency converter for converting said transmit beams of said transmit beam former to transmit radio frequency signals.

17. A transmitter comprising:

a circular array antenna having a plurality of antenna elements disposed circularly;

a coefficient calculator for calculating excitation coefficients for said circular array antenna based on a beam direction and a beam width of a desired antenna pattern;

a plurality of transmit beam formers, each of said transmit beam formers for splitting a transmitted signal into signals, the number of which is the same as the number of antenna elements of said circular array antenna, and multiplying said signals by said coefficients, respectively, thereby to form transmit beams; and

a transmit frequency converter for converting said transmit beams of each of said transmit beam formers to transmit radio frequency signals,

wherein said transmit beam formers are coupled in parallel to said transmit frequency converter, and

wherein said coefficient calculator is commonly coupled to said transmit beam formers.

18. A transmitter comprising:

a circular array antenna having a plurality of antenna elements disposed circularly;

a coefficient calculator for calculating excitation coefficients for said circular array antenna based on a beam direction and a beam width of a desired antenna pattern;

a plurality of transmit beam formers, each of said transmit beam formers for splitting a transmitted signal into signals, the number of which is the same as the number of antenna elements of said circular array antenna, and multiplying said signals by said coefficients, respectively, thereby to form

transmit beams; and

a plurality of transmit frequency converters, each of said transmit frequency converters for converting said transmit beams of said corresponding transmit beam former to transmit radio frequency signals,

wherein said transmit frequency converters and said transmit beam formers are coupled in parallel to said circular array antenna, and

wherein said coefficient calculator is commonly coupled to said transmit beam formers.

19. The transmitter of claim 17, wherein said coefficient calculator comprises means for setting an antenna power of each of said beams, and

wherein said coefficient calculator comprises means for setting the number of beams which is equal to the number of transmit beam formers.

20. The transmitter of claim 18, wherein said coefficient calculator comprises means for setting an antenna power of each of said beams, and

wherein said coefficient calculator comprises means for setting the number of beams which is equal to the number of transmit beam formers.

21. The transmitting system of claim 15, further comprising:

an arrival direction estimating unit for estimating arrival directions of incoming radio waves in relation to traffic conditions; and

a statistical processor for statistically processing outputs of said arrival direction estimating unit to determine said beam direction and said beam width.

22. The transmitting system of claim 15, further comprising:

a storage unit for previously storing beam directions and beam widths,

wherein at least one of said arbitrary beam direction and said arbitrary beam width is read from said storage unit.

23. A radio unit for use with a circular array antenna having a plurality of antenna elements disposed circularly, said radio unit comprising:

a calculator for establishing an antenna pattern for said circular array antenna based upon at least one of an arbitrary beam width and an arbitrary beam direction;

a receive frequency converter for converting radio frequency signals received by said circular array antenna to either intermediate frequency signals or baseband signals;

a receive beam former for multiplying either said intermediate frequency signals or said baseband signals by coefficients calculated by said calculator, respectively, and combining resultant signals;

a transmit beam former for splitting a transmitted signal into signals, the number of which is the same as the number of antenna elements of said circular array antenna, and multiplying said signals by said coefficients, respectively, thereby to form transmit beams; and

a transmit frequency converter for converting said transmit beams of said transmit beam former to transmit radio frequency signals and outputting said transmit radio frequency signals to said antenna,

wherein said calculator is commonly coupled to said receive beam former and said transmit beam former.

24. The radio unit of claim 23, further comprising:

an arrival direction estimating unit for estimating arrival directions of incoming radio waves in relation to traffic conditions; and

a statistical processor for statistically processing outputs of said arrival direction estimating unit to determine said beam direction and said beam width.

25. The radio unit of claim 23, further comprising:

a storage unit for previously storing beam directions and beam widths,

wherein at least one of said arbitrary beam direction and said arbitrary beam width is read from said storage unit.